one carried from seven-tenths of an inch to one inch per hour. In the latter case, with a very high wind sometimes, but rather the exception, there will be seen fine serrations, at intervals of one or two minutes, having the appearance of a very fine saw. These serrations are quite regular, and are seen only during the high wind. The greatest fluctuation cannot be more than eight one-thousandths of an inch and seldom are above four one thousandths to six one-thousandths. It is probable that the wind influences these fluctuations, but it is very difficult to determine just how. That a high wind does not always produce them is quite remarkable. Returning to our drawing chimney, it would seem an interesting computation as to how long a gust would need to last in order to draw out of a chimney one foot square sufficient air to produce the supposed depression.

If we consider that the barograph is inclosed in an almost air-tight case, we have still another addition to our problem. Even if there were a withdrawal of air from the room, is it possible for the influence to reach the inside of the case before the lull has made a change? A partial answer to this question may be had by experimenting with the case. If the door be opened rather suddenly a partial vacuum is formed, or a jar occurs, which moves the float, and the pencil falls or rises according as the barometer has previously had a tendency down or up. This effect is only two one-thousandths of an inch; and it is very rare that an influence greater than that can be brought to bear upon the apparatus under these conditions. It would seem as though the effect produced by opening or closing the case may be many times greater than the utmost that can come from an intermittent wind.

If we turn to the original letter by Mr. Clayton (vol. vii. p. 484), we shall find these particular cases given by him: 1°. "On March 16 the wind's velocity rapidly rose from five to thirty-five miles, and the barometer suddenly fell five one hundredths of an inch;" 2°, "During a sudden gust attending a shower, last summer, the barometer fell a tenth of an inch, and immediately rose again as the gust ended;" 3°, "It [the pressure] fell as much as a tenth of an inch during a seventy-mile wind in February." It will be seen that each of these cases occurred under abnormal conditions, and just at the time when we would naturally expect such fluctuations; but they can hardly be due to the wind, as they are often noted when there is no high wind. The wind's action is intermittent, and there is no evidence whatever of this most important fact making itself known. It is a matter of regret that Mr. Clayton did not open and shut his trap-door at intervals of five or ten minutes, for an hour or so. He would have settled the question beyond doubt if he had done this.

Much has been written in regard to the evidence of observations on Mount Washington. Mr. H. A. Hazen has given a partial discussion of the Mount Washington records in the 'Annual report of the chief signal officer,' for 1882. He there has shown that the effect of the wind upon the computed elevation changes sign at a velocity of twenty-five to thirty miles per hour; i. e., instead of the effect being zero when there was no wind, it was really zero with a wind of twenty-five to thirty miles per hour. This is a fair indirect proof either that the wind does not cause the fluctuation, or, if it does, that another force is superposed upon it.

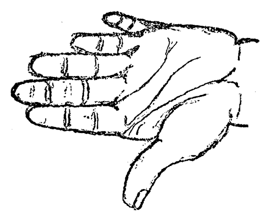
It is hazardous drawing conclusions upon the facts thus far developed. It may be that the wind can produce more than one effect, and that the serration effect above alluded to is not the only one to be considered. The weight of evidence seems to be rather against any great depression being produced. Mr. Clayton will do meteorology a great service by trying a few experiments. If his barograph, shut, is carried along only two inches a day, opening the trap-door ten minutes will give only one seventy-second of an inch for the pencil to move in. The difficulty can be obviated, however, by letting an attendant note the movement of the pencil (if there be any) and carefully take the time of the fluctuations, if the time of manipulating the trap-door be also taken, a comparison of times will settle the question.

GAN.

Aug. 10.

A case of inherited polydactylism.

In the spring of 1883 I saw and examined a case of inherited polydactylism, which I think worth recording. While enjoying the hospitality of a friend, in a charming ravine opening into Napa Valley from the mountains on the west side, my attention was drawn, by my intelligent hostess, to the hands of a German laborer at work in the garden. There were six well-formed, usable fingers on each hand. The metacarpals were of the normal number, but the fifth bore two fingers. The supernumerary little finger differed from the true little finger only in being much smaller.



I give a rude drawing of the left hand, made on the spot, showing the size and position of the supernumerary finger.

I inquired concerning his family history in this regard. His account is given in the following diagram, in which I have italicized those who are or were polydactylous:

Maternal Grandfather. *Maternal Grandmother.*

Father. *Mother.*

Sisters. Bro.

Peter Weitner, *a*, b, c, d; *a*.

Children.

It is seen that the deformity was inherited from his mother's maternal grandmother; that, besides himself, it has affected one sister, out of four, and one brother, and has been transmitted to the children of the sister, thus affecting at least four generations.

JOSEPH LE CONTE.

Berkeley, Cal., Aug. 5.

"Thumb marks."

One of the anatomical characteristics recently brought within the area of anthropological investigation is the marking on the skin of the hand, espe-

cially of the thumb. Indeed, a proposition has been made to us3 this characteristic for identifying the Chinese emigrants to California. In Germany, especially, attempts have been made to show that these markings have racial significance. Has it ever been noticed that this custom has been borrowed from China, where the thumb and finger markings are used for purposes of identification, and by illiterates in signing papers? In the 'Proceedings of the China branch of the Royal Asiatic society,' for 1847, p. 11, is an article on land-tenure in China, by Thos. T. Meadows. Appended to this article is a copy of a deed bearing the thumb-signature of the grantor, a woman. Chinese sailors shipping on junks are made to sign with five fingers, in order to get a more certain identification. Dr. D. B. McCartee informs us that the Chinese class the striae at the ends of the fingers into 'pots' when arranged in a coil, and 'hooks' when they form a curving loop. They say that two men's thumbs may be alike, but that it is hardly possible that their hands would make similar pot-hooks.

WALTER HOUGH.

U. S. national museum, Aug. 10.

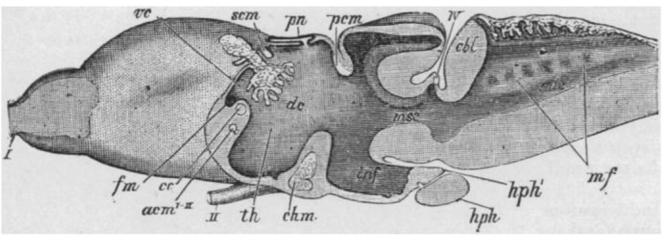


FIG 1. — A vertical section of the frog's brain (*Rana esculenta*): *acm*, anterior commissure; *cc*, or *cal*, corpus callosum; *dc*, or v^3, third ventricle; *fm*, foramen of Monro; *lt*, lamina terminalis; *pr*, pineal gland; *lv*, lateral ventricle; *vc*, ventriculus communis.

The corpus callosum in the lower vertebrates.

The corpus callosum, or great commissure of nerve fibres connecting the cerebral hemispheres, has long been one of the landmarks of comparative anatomy. In every modern work upon zoölogy, this commissure is given as a brain character which distinguishes the mammals from the lower orders of vertebrates. In fact, Owen long maintained that the corpus callosum proper was wanting in the marsupials and the monotremes; and his authority on this point was generally accepted until Flower, in 1865, demonstrated that this commissure is well developed in these animals, although much smaller in relation to the size of the anterior commissure. These observations were soon confirmed by Sander.

It is an interesting fact, as an example of knowledge apparently going backwards, that the earlier anatomists, in studying these commissures, hit much nearer the truth than their successors. For instance, that acute observer, Meckel, so long ago as 1816, correctly described the corpus callosum in the brain of the duck, and Reissner found it in the brain of the frog, in 1867. Other authors gave more or less accurate accounts of this organ in the lower vertebrates. More recently, in 1875, Stieda found it in the brain of the turtle. In face of these statements, all subsequent authorities, including Mihalkovics, Rl. Rückhard, Bellonci, and Stieda (with the exception of his one observation mentioned above), hold that the corpus callosum first arises among the mammals. This error, as it now appears, has sprung from two causes: first, from the difficulty of following the nerve-fibre courses in these small brains, a difficulty which has been to a great extent removed by improved microscopic methods; second, from the following fact: the anterior commissure in the mammalian brain consists of two divisions, one going to the olfactory lobes, the other to the temporal lobes. Recent authors have been led to confuse the commissure which really represents the corpus callosum, with the first-mentioned division of the anterior commissure, the truth being that the distribution of this commissure has never been precisely observed.

During the past winter I had an opportunity of studying the cerebral commissures in types of all the lower orders, in the most thorough manner; and found that the corpus callosum, so far from being a structure peculiar to the mammals, is present in the reptiles, birds, and Amphibia, and probably also in the Dipnoi and other fishes. In short, this commissure is a primitive character of the vertebrate brain. An account of the steps which led to this conclusion would exceed the due limits of this article, but an outline of the results may be given.[1]

For our present purpose, we must recall the embryonic position of the mammalian corpus callosum as a delicate bundle, traversing the thin wall which unites the hemispheres, and known as the 'lamina terminalis.' Below this, in the lamina, is another fibre-bundle, the anterior commissure. In the placental mammals, these bundles, from the time of their first development, are separated by an interval or septum; but in the marsupial brain, at an early stage, they lie close together in the middle line, very much as they are represented in fig. 3, in the turtle's brain (*cal* and *acm*), the upper bundle bending upwards, like a horseshoe; the lower passing outwards in the floor of the lateral ventricle (*lv*).

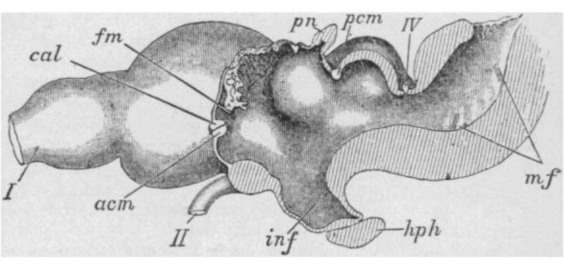


FIG. 2. — A vertical section of the turtle's brain (*Emys Europaea*).

In the brain of the frog, in vertical section (fig. 1), we observe two bundles similarly placed in the lamina terminalis. The lowermost (*acm*) consists of two parts of unequal size, the larger part passing for-

[1] See *Morphologisches jahrbuch*, xii, August.

wards to the olfactory lobes, the smaller passing backwards. They correspond in distribution to the two divisions of the anterior commissure in the mammal. Does the upper bundle, then, represent the corpus callosum? When we follow the distribution

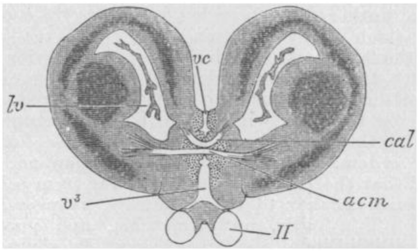


FIG. 3. — Transverse section of the fore-brain of the turtle in the plane of the cerebral commisures.

of its fibres to the upper inner cell-area of the hemispheres, this question seems clearly answered in the affirmative. But here arises a difficulty; this bundle lies below the foramen of Monro, and its fibres pass upwards *behind* the foramen, and then forwards above it. This is exactly the reverse of their position in the mammalian brain; but an explanation is found in the fact that the frog's brain retains many fish characters, and, among them, a large ventricle (the ventriculus communis) common to the two hemispheres, with the cerebral commissures lying in its floor. The brain of the turtle gives us a step nearer the mammalian type; for here, as in the mammal, the cerebral commissures lie in the front wall of the common ventricle, and the callosal bundle passes upwards in *front* of the foramen of Monro, and its fibres spread like rays over the entire inner wall of the hemispheres. Removing all further doubt that this bundle is homologous with the corpus callosum, is the fact that connected with it, as in the mammals' brain, are fibres passing backwards and downwards into a region which corresponds with the

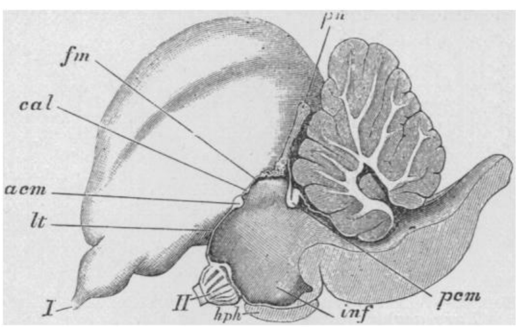


FIG. 4. — A vertical section of the brain of the duck (*Anas boschas*).

mammalian hippocampus. These fibres are usually described as the commissural portion of the fornix. The snake's brain (Tropidonotus) gives us a higher step, for, although the corpus callosum is a less distinct bundle, fibres are observed descending in the lamina terminalis, which in their relations closely resemble the columns of the fornix, — another structure which has been supposed to be peculiar to the mammals. In this brain also the olfactory and temporal divisions of the lower bundle have precisely the same relations as in the mammalian anterior commissure, demonstrating beyond a doubt that the lower bundle represents the entire anterior commissure, and not merely its temporal division, as Stieda and Mihalkovics contend. Upon drawing apart the hemispheres of the freshly removed brain of a duck, we observe a delicate thread of fibres slightly above a large and distinct lower commissure. The former, in transverse section (fig. 5), is seen passing directly upwards into the inner wall of the hemispheres, and below it is a powerful transverse commissure. We cannot fail to recognize that these two bundles are essentially similar in distribution and position to those in the turtle, and that the upper one is a rudiment of the corpus callosum.

Here is seen an apparent anomaly. In the frog's brain, the proportion of the corpus callosum to the anterior commissure is as 2 to 1; in the turtle it is about 5 to 4, while in the birds it is about 1 to 6. Thus, with an ascending scale of intelligence, we find a diminishing corpus callosum, a relation the reverse of that which obtains in the mammals. The

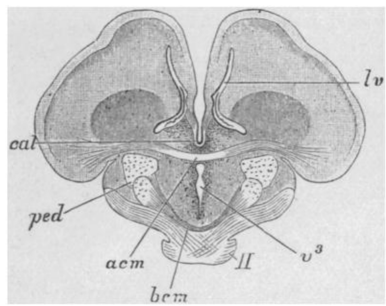


FIG. 5. — A transverse section of the duck's brain through the commissures.

explanation of this is probably that in the Sauropsida generally the inner wall of the hemispheres is thin, and in the birds it is reduced to a mere sheet of nervetissue, and this reduction of distribution area has effected a reduction of the commissure. In all these animals the united commissures are even smaller in proportion to the hemispheres than they are in the monotremes. HENRY F. OSBORN.

A brilliant meteor.

You may think worthy to record the following memoranda of an unusually large and brilliant meteor, reported by Mr. E. Stockin of Watertown, Mass., and seen from that place on Sunday evening, Aug. 8. Time, about 8.45 P. M. Direction, north-east to east. The attention of both Mr. and Mrs. Stockin was first called to the meteor by the flash, which illuminated surrounding objects. On turning, they saw the meteor, apparently about thirty degrees above the horizon. It was of a bright red color, of about one-fourth the size of the moon, occupying five or six seconds in its descent, disappearing behind some buildings while still brilliant, and leaving a trail of brilliantly colored sparks, and subsequently a white streak visible some seconds. The exact direction of the meteor from the observer could be ascertained, if desirable, by means of positions noted at the time. C. H. AMES.

Boston, Mass.